



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,459	01/23/2002	Joseph A. Bailey	95-521	6430

20736 7590 03/07/2006

MANELLI DENISON & SELTER
2000 M STREET NW SUITE 700
WASHINGTON, DC 20036-3307

EXAMINER

JUNTIMA, NITTAYA

ART UNIT	PAPER NUMBER
----------	--------------

2663

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,459

Applicant(s)

BAILEY ET AL.

Examiner

Nittaya Juntima

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/23/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because:
 - in Fig. 1, numeral reference 20 should be labeled as “work notification request”;
numeral reference 30 should be labeled as “system memory”; and
 - in Fig. 2, numeral reference 40 should be relabeled as “Channels Module”;
numeral reference 44 should be relabeled as “Read/Write Host Manager”;
numeral reference 48 should be relabeled as “Receive Service Module”;
numeral reference 50 should be relabeled as “Transmit Service Module”

to provide a better understanding of the drawings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

Art Unit: 2663

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Tzeng et al. (“Tzeng”) (USPN 6,912,604 B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1, as shown in Fig. 2, Tzeng teaches a method in a host channel adapter (HCA 12), the method comprising:

Receiving a work notification request (a work notification request reads on a WQE that specifies a corresponding request for a corresponding prescribed option to be performed by a destination InfiniBand network node, col. 4, lines 28-35) for a specified service level (SL, col. 4,

Art Unit: 2663

lines 40-43), each specified service level associated with a prescribed virtual lane (the SL associates with a VL, col. 4, lines 48-50 and 54-59).

Determining from a link layer module (a link layer module is not term of art and its structure is not defined, therefore reads on the VL arbitration module 60) an ordering position for the prescribed virtual lane corresponding to the specified service level relative to other virtual lanes (col. 5, lines 18-21).

Selectively servicing the work notification request based on the corresponding determined ordering position (col. 5, lines 21-28).

Regarding claim 2, Tzeng further teaches that wherein:

The receiving step includes receiving a plurality of work notification requests (WQEs are received, col. 4, lines 28-35), at least a portion of the work notification requests supplying the respective specified service levels (each WQE includes SL, col. 4, lines 40-42), the service levels assigned to a plurality of the prescribed virtual lanes based on a prescribed mapping (col. 4, lines 48-50).

The determining step includes determining an ordering position for at least one of the prescribed virtual lanes (col. 5, lines 18-21).

The selectively servicing step including selecting a sequence for servicing the work notification requests based on the determined ordering position (col. 5, lines 21-28).

Regarding claim 3, Tzeng also teaches that the selectively servicing step includes first servicing a first (high-priority) group of the work notification requests associated with a first (high-priority, e.g. FIFO 52b) of the prescribed virtual lanes having a first ordering position (high-priority), the first ordering position specifying the virtual lane currently serviced by the

Art Unit: 2663

link layer module (the VL arbitration module 60 in Fig. 2 would empty the VL FIFO 52b before servicing other virtual lanes, col. 5, lines 14-28, therefore, it is inherent that at one point in time, the high-priority virtual lane FIFO 52b must be currently serviced).

Regarding claim 4, Tzeng teaches that the selectively servicing step further includes second servicing following the first servicing step (high-priority), a second group of the work notification requests associated with a second of the prescribed virtual lanes (the next virtual lane to be serviced having lower priority than the high-priority VL FIFO 52b) having a second ordering position (next priority level lower than the high priority level), based on at least one of completing servicing the first group (last WQE from high-priority VL FIFO 52b completed) and reaching a prescribed threshold (the maximum number of WQEs stored in the high-priority VL FIFO 52b) associated with the first (high-priority) of the prescribed virtual lanes (col. 5, lines 7-9 and 14-28).

Regarding claim 5, Tzeng further teaches that the determining step includes receiving from the link layer module (an inherent element within the VL arbitration module 60 that keeps track of the current virtual lane being processed) processing information specifying a current virtual lane being processed by the link layer module, the ordering position determined based on the processing information (since the VL arbitration module 60 determines which virtual lane to service based on the determined priority of the virtual lanes, col. 5, lines 18-21, therefore, the VL arbitration module 60 must have an internal element that keeps track and notifies the VL arbitration module 60 of the current virtual lane being serviced in order to assist the VL arbitration module 60 to determine the priority of a particular virtual lane relative to other virtual lanes).

Art Unit: 2663

Regarding claim 6, Tzeng teaches a host channel adapter (HCA 12) comprising:

A link layer module (a link layer module is not term of art and its structure is not defined, therefore reads on the VL arbitration module 60) for selecting one of a plurality of virtual lanes, for data transfer, based on an identifiable ordering position (priority level) (col. 5, lines 14-21).

A transport layer module (a transport layer module is not term of art and its structure is not defined, therefore reads on the pre-link module 40) for receiving a work notification request (a work notification request reads on a WQE that specifies a corresponding request for a corresponding prescribed option to be performed by a destination InfiniBand network node, col. 4, lines 28-35) for a specified service level (SL, col. 4, lines 40-43), the transport layer module for identifying the virtual lane and the corresponding ordering position associated with the specified service level, and selectively servicing the work notification request based on the identified ordering position for the identified virtual lane (col. 4, lines 4-9, 24-28, 56-59, and col. 5, lines 18-21).

Regarding claim 7, Tzeng further teaches that wherein:

The transport layer module (the pre-link module 40 includes a virtual lane arbitration module 60, col. 4, lines 4-9 and 23-27) is configured for selecting for servicing from a plurality of received work notification requests (WQEs are received, col. 4, lines 28-35), a first group of the received work notification requests for a service level (WQEs include SL, col. 4, lines 40-42) associated with a first (high priority) of the virtual lanes having a first ordering (high priority) position at least a portion of the received work notification requests supplying the respective specified service levels (col. 5, lines 7-11 and 14-28).

Regarding claim 8, Tzeng teaches that the transport layer (the pre-link module 40 which includes the virtual lane arbitration module 60, col. 4, lines 23-27) is configured for determining the first ordering (high-priority) position based on identifying the first virtual lane as the one selected virtual lane (the virtual lane arbitration module 60 would empty the high-priority virtual lane, e.g. FIFO 52b, before servicing other virtual lanes, col. 5, lines 18-21).

Regarding claim 9, Tzeng also teaches that the transport layer module (the pre-link module 40 which includes the virtual lane arbitration module 60, col. 4, lines 23-27) is configured for selecting for servicing, following the first group (high-priority), a second group of the received work notification requests specifying a service level associated with a second of the virtual lanes (the next virtual lane to be serviced having lower priority than the high-priority VL FIFO 52b) having a second ordering position (next priority level lower than the high priority level), based on at least one of the transport layer module completing servicing the first group (last WQE from high-priority VL FIFO 52b completed) and the link layer module (the virtual lane arbitration module 60) reaching a prescribed threshold (the maximum number of WQEs stored in the high-priority VL FIFO 52b) associated with the first of the virtual lanes(col. 5, lines 7-9 and 14-28).

Regarding claim 10, Tzeng teaches that the transport layer module is configured for servicing the work notification request by retrieving a work queue entry from a prescribed location in system memory (the pre-link module 40 which includes the pre-link process module 54 that retrieves a WQE from the WQE FIFO 50, col. 4, lines 23-27 and 56-59).

Conclusion

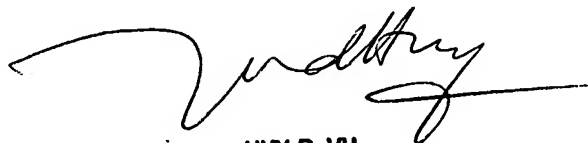
Art Unit: 2663

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nittaya Juntima
March 3, 2006
NS



HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600